

What is claimed is:

1. A shaft seal for sealing an outer circumferential surface of a rotary shaft to a housing, comprising:

5 a lip seal including:

a lip body fixed at a housing side;

a lip portion extending from the lip body, the lip portion having inner and outer circumferential surfaces, the inner circumferential surface of the lip portion being in contact with the outer circumferential surface of the rotary shaft, the lip portion being deformable;

a support portion formed at the outer circumferential surface side of the lip portion for applying tensile force to the lip portion when the lip portion is deformed toward the inner circumferential surface side of the lip portion; and

15 a receiving portion formed at the outer circumferential surface side of the lip portion for receiving the pressure in the housing.

2. The shaft seal according to claim 1, wherein the support portion is arranged at the top end of the lip portion.

20 3. The shaft seal according to claim 1, wherein a plurality of the support portions is arranged in the circumferential direction of the lip portion at a

predetermined interval.

4. The shaft seal according to claim 1, wherein the support portion connects the outer circumferential surface of the lip portion with the lip body.

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5. The shaft seal according to claim 4, wherein the support portion is formed integrally with the lip body and the lip portion.

6. The shaft seal according to claim 4, wherein the support portion is formed separately from the lip body and lip portion.

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7. The shaft seal according to claim 1, wherein the support portion is constituted of elastic member.

8. The shaft seal according to claim 7, wherein the elastic member is made of one of rubber, resin and metal.

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9. The shaft seal according to claim 7, wherein the elastic member is one of a coil spring and a leaf spring.

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10. The shaft seal according to claim 1, wherein the support portion forms a rod having one of rectangular and circular transverse cross sections in shape.

11. The shaft seal according to claim 1, wherein the support portion forms a thin plate in shape.

5 12. The shaft seal according to claim 1, further comprising a holding member arranged at the inner circumferential surface side of the lip portion for holding the lip portion.

13. A compressor comprising:

10 a housing;

a compression mechanism placed in the housing for compressing refrigerant;

a drive shaft rotatably supported by the housing for driving the compression mechanism;

15 a shaft seal interposed between the housing and the drive shaft for sealing an outer circumferential surface of the drive shaft to the housing, the shaft seal including:

a lip seal including:

a lip body fixed at a housing side;

20 a lip portion extending from the lip body, the lip portion

having inner and outer circumferential surfaces, the inner

circumferential surface of the lip portion being in contact with the

outer circumferential surface of the drive shaft, the lip portion  
being deformable;

a support portion formed at the outer circumferential  
surface side of the lip portion for applying tensile force to the lip  
5 seal when the lip portion is deformed toward the inner  
circumferential surface side of the lip portion; and

a receiving portion formed at the outer circumferential  
surface side of the lip portion for receiving the pressure in the  
housing.

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14. The compressor according to claim 13, wherein the support portion is  
arranged at the top end of the lip portion.

15. The compressor according to claim 13, wherein a plurality of the support  
15 portions is arranged in the circumferential direction of the lip portion at a  
predetermined interval.

16. The compressor according to claim 13, wherein the support portion  
connects the outer circumferential surface of the lip portion with the lip body.

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17. The compressor according to claim 16, wherein the support portion is  
formed integrally with the lip body and the lip portion.

18. The shaft seal according to claim 16, wherein the support portion is formed separately from the lip body and lip portion.

5 19. The compressor according to claim 13, wherein the support portion is constituted of elastic member.

20. The compressor according to claim 19, wherein the elastic member is made of one of rubber, resin and metal.

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21. The compressor according to claim 19, wherein the elastic member is one of a coil spring and a leaf spring.

22. The compressor according to claim 13, wherein the support portion forms  
15 a rod having one of rectangular and circular transverse cross sections in shape.

23. The compressor according to claim 13, wherein the support portion forms a thin plate in shape.

20 24. The compressor according to claim 13, the shaft seal includes a holding member arranged at the inner circumferential surface side of the lip portion for holding the lip portion.

25. A method for sealing an outer circumferential surface of a rotary shaft to a housing, the method comprising the steps of:

interposing a lip seal having a lip portion between the housing and the  
5 rotary shaft;

contacting the lip portion with an outer circumferential surface of the  
rotary shaft;

forming a support portion at an outer circumferential surface side of the  
lip portion so as to apply tensile force to the lip portion when the lip portion is  
10 deformed toward an inner circumferential surface side of the lip portion; and

forming a receiving portion at the outer circumferential surface side of the  
lip portion so as to receive the pressure in the housing.